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ALMAZ

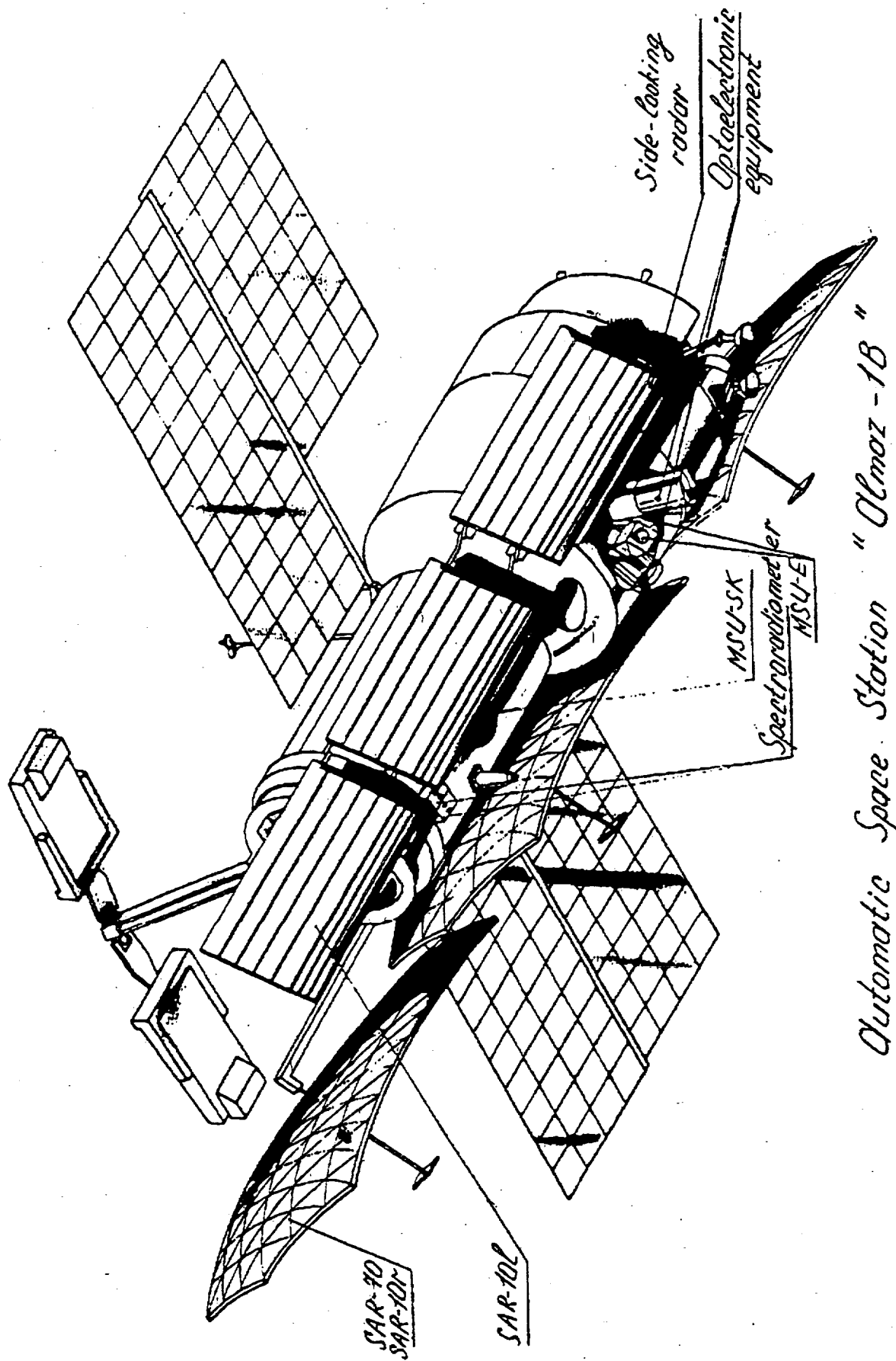
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BASIC DATA OF THE AUTOMATIC SPACE STATION "ALMAZ-1B"

Launch vehicle	Proton
Operational orbit parameters:	
• Altitude	350-400 km
• Inclination	73 grad
On-orbit mass	18,550 kg
On-board scientific equipment mass	up to 4,500 kg
Active operation time	up to 3 years
Orientation & stabilization accuracy:	
• Orientation	15-30 min. of arc
• Stabilization	4-6 min. of arc
Power-generating system characteristics:	
• Available average power per turn	2,300-3,300 W
• Maximum power (at peak load up to 15-20 min.)	8,600 W

ALMAZ-1B AUTOMATIC SPACE STATION

1. SAR - 70
SAR - 10 r
2. SAR - 10 l
3. Multizonal Scanner MSU-SK
4. Spectroradiometer
5. Multizonal Scanner MSU-E
6. Side-looking Radar
7. Optoelectronic Equipment



Automatic Space Station "Olmaz-18"

**PRINCIPAL TECHNICAL CHARACTERISTICS OF REMOTE SENSING
EQUIPMENT ON THE ALMAZ-1B SPACE STATION**

A Set of Variant 1

1. Principal technical characteristics of radar equipment

1.1. Synthetic aperture radar SAR-10

Operating wavelength range	9, 6 cm	
Polarization	- horizontal (port) - horizontal or vertical (starboard)	
Scanning direction	port or starboard at will	
Angle of sight from nadir while turning	25 - 50 grad	
Scanning field for re-shooting while turning	320 km	
Time of continuous survey	up to 1,200 s	
Mode of operation	<u>detailed</u>	<u>general view</u>
scanning field	25 - 50 km	100 - 150 km
resolution	5 - 7 m	15 m

1.2. Synthetic aperture radar SAR-70

Operating wavelength range	70 cm
Polarization	horizontal or vertical
Scanning direction	starboard
Angle of sight from nadir	25 - 50 grad
Scanning field for re-shooting while turning	320 km
Time of continuous survey scanning	up to 1,200 s
Scanning field	100 - 150 km
Resolution	15 - 25 m

1.3. Side-looking radar

Angle of sight from nadir while turning	25 - 55 grad
Operating wavelength	3, 6 cm
Swath width	450 km
Resolution	400 - 1,200 m

2. Optoelectronic equipment for stereophotography

Number of operating ranges	5
Resolution on the ground	2 - 4 m
Swath width	70 km

3. Characteristics of multizone high-resolution electronic scanner MSU-E

Number of operating ranges	3
Resolution on the ground	10 m
Swath width	2 x 24 km
Potential angles of view	32 grad
Number of on-board sets	2

4. Characteristics of multizone middle-resolution optomechanical scanner MSU-SK

Number of operating ranges	5
Resolution on the ground	
- in visual range	80
- in IR range	300 m
Swath width	300 km

5. Characteristics of spectroradiometer for ocean satellite monitoring

Scanning field	2 x 1,100 km
Number of spectral zones	11
Boundaries of spectral zones	0.4 - 12.5 mkm
Linear resolution at nadir	0.6 km
Temperature resolution	0.1 K

6. Information transmission

Direct transmission to available receiving stations located on the Russian territory and abroad

Data collection on board and transmission to these stations when flown over

Data collection on board and transmission via relay-satellite to central receiving station

7. Effectiveness of information reception

Directly to receiving stations	no more 12 h
via relay-satellite	no more 2.5 h

8. Rate of information transmission

Directly to receiving stations	122.8 Mbit/s
Via relay-satellite	10 Mbit/s
Direct transmission to mobile and small receiving stations	3 Mbit/s or 960 Kbit/s

MAIN FIELDS AND DIRECTIONS OF ALMAZ-1B SPACE INFORMATION APPLICATION

CARTOGRAPHY

- Updating and completing topographic and thematic maps
- Cities development planning
- Transport networks planning
- Mapping of shelf shallow sections

LAND MONITORING

- Information supply of earth catastrophe, lands, forests, pastures and water resources
- Compiling soil maps and determining humus content
- Taking inventory and forecasting harvest yield
- Determining soil temperature and moisture content
- Detecting underground water sources

GEOLOGY

- Revealing perspective areas for mineral prospecting
- Geologic mapping
- Planning and controlling mineral/raw-mineral base
- Specifying data of mining and oil-bearing regions
- Monitoring large open-cast mining development

ECOLOGICAL MONITORING

- Controlling chemical compounds content in soil
- Controlling technogenic actions
- Controlling soil salinization and desertness
- Controlling soil erosion
- Controlling pollution of water surfaces with petroleum products
- Revealing underground unpermitted burials of industrial waste

OCEANOLOGY, PILOTAGE, FISHERY

- Evaluating ice conditions for pilotage
- Controlling chlorophyll content, evaluating bio-productivity of the world's ocean regions
- Studying the world's oceans and seas
- Compiling ocean temperature maps, pollution recording, studying fronts, currents, water, wind, etc.

INFORMATION SUPPLY DURING EMERGENCY

- Controlling situation in geologically dangerous regions (earthquakes, mudslides, avalanches, volcanic eruptions)
- Detecting forest and peat fires
- Controlling situation during accidents at industrial sites (fires, explosions, construction crashing down)

- Controlling situation in large transport accident regions including underground product tubes
- Controlling situation in hydrodynamic accident regions (dams, locks, sewage works)